ABSTRACT

The present invention is a digital dynamic compression or automatic gain

5 control (AGC) (10) adapted for use in high quality audio and hearing aids

applications. An efficient digital AGC design employs two compact ROM-based

tables (ROM_CSD, ROM_SPL) in addition to two comparators (COMP_A,

COMP_B) and several registers (REG_A, REG_B, ADDR_A, ADDR_B). While

one ROM stores the values of discrete input signal levels, the other contains gain

10 codes based on a canonical signed digit (CSD) coding approach that leads to a

very simple gain multiplier (20). In many cases an extremely compact table for

gain values can be achieved by reusing a single small-size ROM that behaves like

one that is several time larger. Two design examples are shown to expound the

insights of the new digital AGC design. For the less-than-half-dB-gain-step cases

15 only two adders are required for the multiplier whereas just three adders are

needed in the situations with less than quarter-dB gain steps.

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